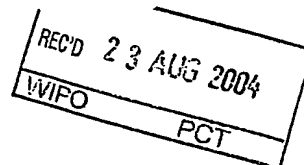


PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



03 DEC 2004

Applicant's or agent's file reference M801-PCT	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)
International application No. PCT/JP 03/07091	International filing date (day/month/year) 04.06.2003	Priority date (day/month/year) 05.06.2002	
International Patent Classification (IPC) or both national classification and IPC C08K9/02		EPO - DG 1 23. 09. 2004	
Applicant SHOWA DENKO K. K. et al.			

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1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

I ☒ Basis of the opinion

II ☐ Priority

III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

IV ☐ Lack of unity of invention

V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

VI ☐ Certain documents cited

VII ☐ Certain defects in the international application

VIII ☐ Certain observations on the international application

Date of submission of the demand 21.10.2003	Date of completion of this report 19.08.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Russell, G Telephone No. +49 89 2399-8738



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/JP 03/07091

1. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17):*

Description, Pages

1-55 as originally filed

Claims, Numbers

1-26 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

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EXAMINATION REPORT**

International application No. **PCT/JP 03/07091**

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-26
Inventive step (IS)	Yes: Claims	
	No: Claims	1-26
Industrial applicability (IA)	Yes: Claims	1-26
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/JP 03/07091

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

D1: WO-A-02 22098

D2: Patent Abstracts of Japan vol. 1999, no. 12, 29 October 1999 (1999-10-29) & JP-A-11 193354

D3: US-A-2002 041853

D4: Database WPI Section Ch, Week 200121 Derwent Publications Ltd., London, GB; Class D21, AN 2001-204991 & JP-A-2000 319128

2. Novelty (Article 33(2) PCT)

The subject-matter of claims 1 to 26 is not novel in view of the cited prior art disclosures D1 to D4.

- 2.1 D1 discloses a cosmetic composition having blended therein silica-, alumina- or alumina/silica-coated particulate titanium oxide and silica-, alumina- or alumina/silica-coated particulate zinc oxide at a mass ratio of 1: 4 to 2: 3, the particulate titanium oxide and the particulate zinc oxide each having an average primary particle size of 0.01 to 0.2 μm (claim 1), wherein the silica coating on the titanium oxide and zinc oxide has a thickness of 0.1-100 nm (claim 10). The coated zinc oxide has a primary particle size of 0.01 to 0.2 μm , preferably from 0.01 to 0.12 μm (page 29), lower than 5 μm as stated in current claim 1. Particle sizes outside this range are said to be detrimental to providing a high UV-shielding effect.

The surfaces of the silica-coated titanium oxide and zinc oxide particulates are further made hydrophobic by using a hydrophobizing agent selected from the group consisting of silicone oils, alkoxysilanes, silane coupling agents, and higher fatty acid salts (claims 11, 12).

The silica-coated particulate titanium oxide and the silica-coated particulate zinc oxide each has a photocatalytic activity of 60 Pa/min or less (claim 13), a dye discoloration rate of 0.1 or less (claim 14), an organic ultraviolet absorber decomposition rate of 0.02 or less (claim 15), and an organic ultraviolet absorber decomposition percentage of 5% or less (claim 16). The ratio of the IR absorption at 1150 to 1,250 cm^{-1} to that at 1,000 to 1,100 cm^{-1} is 0.2 or more, and the refractive index is 1.435 or more (page 15, 14-24).

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

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Examples 8-10 (Table 7; page 62) describe cosmetic compositions comprising silicone-treated silica-coated zinc oxide and similarly treated titanium oxide in the presence of thermoplastic polysiloxane and polyether which is applied as a film to a glass test plate.

Hence, D1 is novelty-destroying for the subject-matter of claims 1-21, 23, 24, and 26.

- 2.3 D3 claims cosmetic compositions comprising silica-coated titanium oxide or zinc oxide coated with a certain dense silica film of thickness 0.1-100 nm, a primary particle size of 5-200 nm, and a refractive index of 1.435 or more which is blended in combination with a polymer having a carboxyl group in the side chain (claims 1, 7, 8). The surface may be hydrophobized using materials such as higher fatty acid metal salt, silicone oil, or silane coupling agent ([0073-0074]). The photocatalytic activity of the silica-coated titanium oxide or silica-coated zinc oxide is 60 Pa/min or less, the ratio I of absorption peak intensity is 0.2 or more, and the organic ultraviolet absorber decomposition rate is 0.01 or less (claims 8-12). Cosmetic formulations are described in Examples 1-20 comprising the silica-coated zinc oxide and a carboxyvinyl polymer and PEG. Therefore, novelty is not given over D3 for claims 1-11, 20-22, and 26.

- 2.4 D2 describes zinc oxide particles coated with silica which is used as ultraviolet screening material in cosmetics, adhesive, moulded articles, and paints. The said zinc oxide particles coated with silica contains silica in an amount of 5-100 wt.% based on the zinc oxide and the coated particle comprises at least 90 wt% of particles having a particle diameter of 0.1-9.0 μm and an average diameter of 0.5-5.0 μm . The photocatalytic activity of the ZnO is thereby lowered. The treated ZnO particles can be blended into resins such as PVC, polyolefins, and polystyrene resins ([0036-0037]), or mixed with untreated-titanium oxide in cosmetic formulations ([0067]), or coated as a paint film on aluminium board ([0048]). The parameters given in the specifications claims 7 through 11 are not disclosed in D2. Since the silica-coated zinc oxide particles are similar to those claimed, it cannot be ruled out that said parameters are also fulfilled (see EPO Guidelines C-II 4.7a; C-IV 7.5).

Thus, at least claims 1, 4-13 and 20-26 are not considered new in view of D2.

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2.5 D4 relates to a metal oxide coated with modified silica for protecting UV-ray in cosmetics, paints, adhesive agents or resin-molded articles. Resins useable include polyolefins, polystyrene, acrylic resin, and polycarbonates ([0020]). Example 4 describes a silica-coated zinc oxide particle of primary particle size of 30-50 nm in an acrylic lacquer which is coated on a tin plate. Example 11 describes a polystyrene resin composition comprising the treated particles extruded to a strand. Example 16 also contains titanium oxide. At least claims 1, 4-6, 12, 13, and 20-26 are not new in view of D4.

3. Inventive step (Article 33(3) PCT)

The advantageous use of a silica-coated zinc oxide of small primary particle size whether hydrophobized or not, or in combination with silica-coated titanium oxide, in cosmetic compositions and shaped articles regarding reduced photocatalytic activity of the ZnO, UV shielding effect, dye colour fading, organic UV absorber decomposition is already known in prior art D1 and D3.

Thus, the inventive concept underlying the present application is composed in the state of the art such that an inventive step cannot be recognized.